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Tomcat Overview

Programs need an environment in which to run within a host computer. Sometimes the operating system is sufficient to provide the environment, but at other times a more sophisticated container is needed. Tomcat is a container that's used to provide an environment for Java code running on a web server.

If you're going to be running Java code on your web server (either in the form of Servlets or Java Server Pages), then you'll need appropriate software for the purpose. An operating system isn't enough as it won't provide your Java Runtime Environment, nor your web server, nor the tools to tie Java to the web. You'll need a **container** in which to run your Servlets and JSPs, and the most commonly used container is **Tomcat.**

23.1 What is Tomcat?

Visit *http://jakarta.apache.org/tomcat/index.html* and you read:

"Tomcat is the servlet container that is used in the official Reference Implementation for the Java Servlet and JavaServer Pages technologies. The Java Servlet and JavaServer Pages specifications are developed by Sun under the Java Community Process."

And...

"Tomcat is developed in an open and participatory environment and released under the Apache Software License. Tomcat is intended to be a collaboration of the best-of-breed developers from around the world."

Buzzwords.

Perhaps we had best start with some definitions, starting at the top of the tree:

Apache

"The Apache software foundation provides support for the Apache community of open-source software projects. The Apache projects are characterized by a collaborative, consensus based development process, an open and pragmatic software license, and a desire to create high quality software that leads the way in its field."

Amongst the projects that come under the "Apache" banner are the HTTP Web Server from which the whole Apache project has grown, and which is the container used for the majority of web sites worldwide, Ant (a build tool which allows the developer excellent control of the compiling and bundling processes), and Jakarta.

Jakarta

"The Jakarta Project creates and maintains open source solutions on the Java platform for distribution to the public at no charge. Jakarta products are developed by and distributed through various sub-projects."

Jakarta is the name for the Apache project which deals with the provision of open source additions in Java. More than 20 such additions (known as sub-projects) are listed on their web site, including Struts[1] and Tomcat.

Tomcat

Tomcat is a servlet container for the Java Servlets and JavaServer Pages. It provides a Java Virtual Machine and associated elements to give a complete Java Runtime Environment, and it also provides web server software to make that environment accessible on the Web. Configuration and management tools are also provided, with configuration data largely held in XML.

It's worth noting that Tomcat is much more than just an implementation of Servlets and JSPs, it's the official reference implementation and the standard against which all other suppliers of containers for Servlets and JSPs must measure their products. It means that developers know that if they develop code that works under Tomcat, that code should work under other containers that conform to the standards set.

[1] provides an application controller to allow separation of the business model from the view

Current reference versions are:

Servlet Spec	JSP Spec	Tomcat version
2.4	2.0	5.0.25
2.3	1.2	4.1.27
2.2	1.1	3.3.1a

Tomcat itself has a number of elements to it, such as Catalina, Coyote and Jasper.

Catalina

Catalina is the Servlet Container portion of Tomcat.

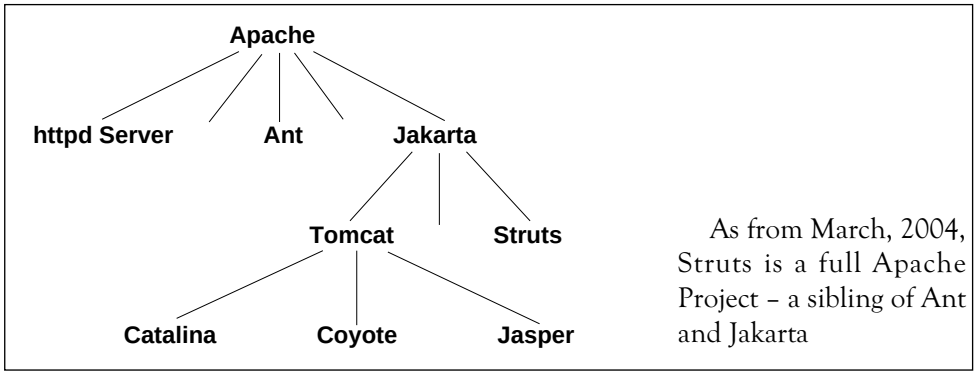
Coyote

Coyote is the Web connector.

Jasper

Jasper is the JSP Engine that's used inTomcat from version 4.1.

Figure 82 Structure of Apache projects, and how Tomcat fits within that structure

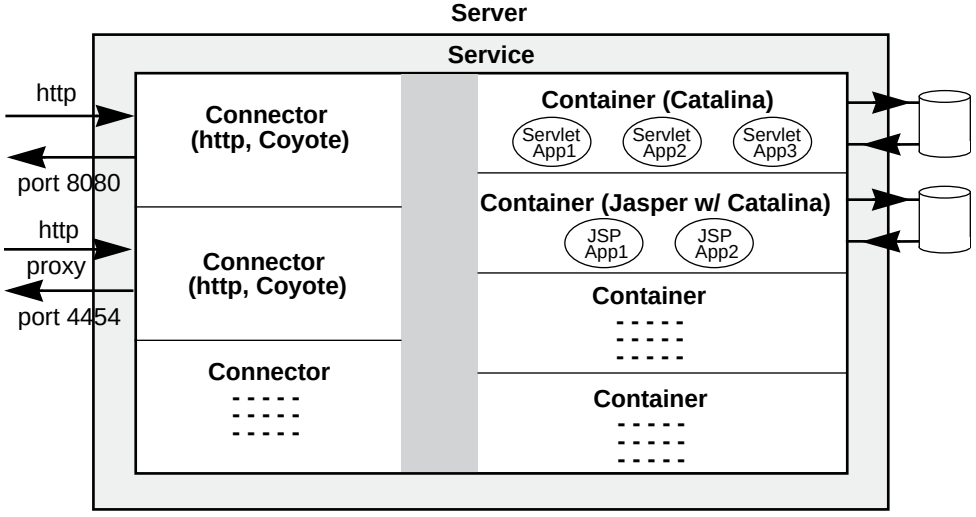


23.2 The structure of Tomcat

Tomcat runs as a Windows service or a Linux or Unix Daemon, awaiting connections (by default) on port 8080. A single instance of Tomcat can provide several services, though this is unusual.

Each Tomcat service will have at least one (and possibly more) connectors, and at least one (and possibly more containers) in which an engine such as Catalina provides a service.

Figure 83 Structure of Tomcat



Server, Service, Connector, Container and Engine are all very flexibly configurable, and the default application configuration can be overridden on a per-application basis if need be.

The Tomcat Manager is a useful application which runs in one of the standard Tomcat containers and is used to control loading, reloading and unloading of individual applications or of the engine as a whole.